THE Chemist

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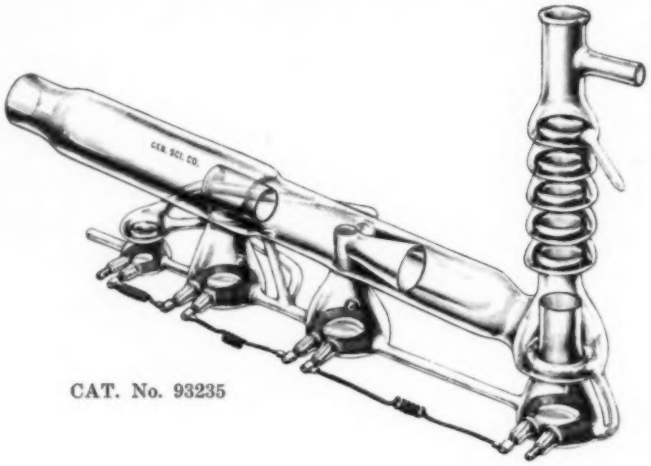

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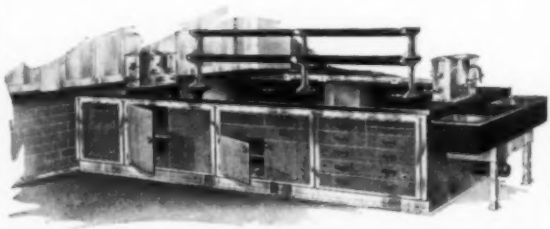

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The following papers are those presented at the dinner given by the Chicago Chapter of THE AMERICAN INSTITUTE OF CHEMISTS on October sixth, in honor of Robert Brinton Harper.

MOST of us are interested in our futures. Some of us complain about our lot in life and feel that as chemists we do not get the recognition, compensation and position to which we are entitled.

Most of us, at one time or another, ask ourselves such questions as, "Can I succeed in life?" "Can I conduct my business successfully?" "Can I advance in the corporation in which I work?" "Can I become an outstanding chemist?" As an aid to the answering of such questions in the affirmative, we have dedicated such an organization as ours—THE AMERICAN INSTITUTE OF CHEMISTS, INC. We expect our institute (and I now quote from the frontispiece of the October, 1940, issue of our publication, THE CHEMIST): "To give chemists professional solidarity. To put the profession back of a definite code of ethics. To insist on adequate training and experience qualifications. To educate the public to an understanding of what a chemist is. To protect the public and the profession by fighting quackery. To raise the economic status of chemists."

We must realize at the outset that our discussion leads us into the vast field of human relations which, in many respects, is unlike the field of chemical relations. Human relations and reactions are not nearly so subject to scientific analysis, prediction and control as are those of chemistry. However complex, unpredictable and uncontrollable human relationships may be, they are far more important than our knowledge of chemistry and skill in its techniques in determining our futures as chemists. It may sound like heresy for me to say this, but I am convinced that it is fundamentally true.

Studies made concerning the factors contributing to the success of engineers and professional groups have repeatedly disclosed the great impor-

tance of the human qualities. These have substantiated and fortified my own conclusions derived from observations over a long period of years.

Success for chemists is probably only about fifteen per cent due to our knowledge of chemistry and to our skill in its techniques, and approximately eighty-five per cent to our general qualifications of character, judgment, efficiency and understanding. Do we realize this? I sometimes wonder.

We so devote our lives to the study and practice of chemistry that too often we sorely neglect vital phases of good human relationships. When we, as chemists fail, we generally fail because of such neglect.

What is Success?

Now what is this thing called success? What is success for the chemist? The dictionary defines success as "a favorable or prosperous termination of anything attempted." Some people measure success in terms of dollars or worldly goods. Others measure it in terms of professional standing and public esteem. Still others feel it lies in the attainment of quiet, happy, and useful lives.

A few believe they have acquired it when they have achieved great power. So we find that success does not mean exactly the same thing to every individual. Nevertheless every form of success has a common bond in being involved with human relationships. Therefore, in human relationships we should expect to find the answers to some of our questions.

Let us first briefly consider human relationships historically. For thousands upon thousands of years human beings have been trying to get along with each other. Some progress has been made. We call this "civilization." The lessons learned by one generation are sometimes too soon forgotten or never learned by the following generation. Advancements attained in human culture are trampled upon by the ignorant and uncultured.

Many centuries of experience have argued against the taking of human life and property and in favor of friendliness and cooperation between human beings in the eternal struggle for the advancement and happiness of mankind. But, as individuals and nations, we too often still resort to tactics worse than those of beasts of the jungle in settling our differences. Therefore, it is safe to say, the world of human beings as a whole, is still only partially civilized.

Perhaps it is too much to expect the world of humans ever to become so developed intellectually as to control its actions with common sense and not to be swayed by the baser emotions of anger, avarice, envy, hate, rage, and selfishness. In any event, we must consider the world of men and women as we find it today. What do we find?

Just now we find strong destructive currents of discontent, class hatred,

and abuse of power. We find individualism being swamped in a mass of paternalistic control. We find large and useful cooperative groups and corporations being condemned by the demagogue and his followers. We find pressure groups mainly concerned with the blind furtherance of their own selfish interests to the detriment of others and ultimately of themselves. We find governments becoming the masters and not the servants of their peoples. After thousands of years, we find the human race jeopardizing its governmental, industrial, and social life.

The play of contrasting forces bewilders us. Yet out of the chaotic display, we can still carry on and discern the operation of those better human relationships upon which our advancements have always rested.

It would seem logical to assume that the time-tested products of human experience must ultimately survive. Hence, we would do well still to cultivate those characteristics which are approved but not always followed by the world in which we move. We must become balanced individuals and groups in order to succeed. We cannot expect to be extremist and get ahead. If we must become extremists let us do so in those fields of human relationships which cause least disapproval by our fellow-men.

In olden times, the scientist was often considered as extremist by his fellow-man and paid for it with his life. Today, conditions are somewhat better, so we can buck the rapids of human emotion and belief to a considerable extent.

Adjustment Necessary for Success

Effective effort toward the goal of success must be directed with due regard to the variable circumstances in each case. Success is dependent upon continual adjustment to established standards of value. The responsibility for wise choice of action rests upon the individual. Do not blame the other fellow if you make the wrong choice. After all, each individual paints his own picture and if his associates and the public do not like it, he has no one to blame but himself.

Let us first be like the old lady who asked the zoo attendant, "My good man! What kind of an animal is this?" The attendant replied, "Madam! That is the largest hippopotamus in captivity."

"Thank you," she said, "But would you mind telling me whether this hippopotamus is a male or female?"

"Not at all, My good lady!" the attendant replied, and then somewhat hesitatingly added, "But what difference does it make?"

The old lady, somewhat startled at the nature of the inquiry, reflected a bit and said, "My good man! Generally speaking, I don't suppose that it does make any real difference, except to another hippopotamus!"

We should be like this old lady and

have her deep interest in all things and at the same time be as philosophical in the realization that groups of human beings of like mind are often too confined in their interests. Like the hippopotamus, they are primarily and, too often, interested only in others of their own kind.

We often find the chemist making comparisons of the standing of his profession with some other professional group such as that of lawyers or of doctors. Often he does this in the conviction that the legal and medical professions, to say nothing of the clergy, far outshine him in the public eye and in the ability to obtain large monetary reward for their services.

As the lawyer would say—"Let us examine the record." Consider, if you will, the professions of *doctor, lawyer, chemical engineer* and *chemist*. In the order named, the first profession practices in a field very close to human beings. Since self-preservation is said to be the first law of life, it is only natural that the successful doctor stands high in the esteem of his clients and the public in general. The doctor is concerned with the health and activities of his patients. Hence he is concerned almost wholly with human problems and relationships.

Like the doctor, the successful lawyer also is concerned in his daily practice largely with relationships between human beings and hence, also commands much respect from his clients and the public.

The Chemist Should Humanize his Activities

On the other hand, the chemist too often is primarily concerned with Nature's vast store of chemical elements and compounds. He concerns himself with chemical relationships. He arranges marriages between the elements. He delights in joining one of the light-headed atoms of the "hydrogen" clan to a member of that highly scented chorus known as "halogens" and sending them on their acidulous career to take the hide off of old man iron.

He also takes delight in divorcing well-established and satisfied combinations of the chemical elements. He introduces "ethyl" promiscuously here and there. He loses himself in the antics which "hilarious" hydrogen, "polygamous" carbon, "greedy" oxygen and their multiplicity of combinations can perform. He deals with chemical radicals and with those spark plugs of the chemical world known as "catalysts." In short, there are so many interests and possibilities in the field of chemistry, that chemists may well be pardoned for their concentration on matters chemical rather than on human relationships.

Yet they must remember that if an explorer goes too far afield and loses contact with the everyday world, the world loses contact with him and knows little of his whereabouts or discoveries. Only he and his associates know clearly what is going on—what

has been accomplished.

It is this preoccupation of chemists with "molecules" rather than with "men" which may appear to place them at a disadvantage with the members of other professions in the public eye and esteem.

In this connection, I am reminded of a colored motion picture film called, "Men, Machines and Molecules," which we developed to depict the activities of our research and testing departments. You will note this title puts the word, "Men," in first place. This is as I feel it should be, for the importance of their effects upon successful lives, is very much in accordance with that order.

Each analysis indicates then that more attention by the chemist and engineer to these factors in life which are generally concerned with human relationships can do much to raise these professions in the public esteem. My own observations lead to this conviction.

Examples of Failure or Success

I propose to cite you some actual examples of failures and successes, according to various methods of measurement. These indicate both pitfalls and advantages in the climb to wealth, prominence, happiness or power, and various combinations thereof.

Let us start with the young man or woman who has just been graduated from an educational institution, to begin earning a living. The graduate may have much knowledge but little wisdom and, in the bargain, be blind to the distinction between the two.

Much too often I have found graduates who, having acquired an exceptionally good chemical education, seem to be thoroughly satisfied with themselves. Such persons practically cease to add to their education after getting into business. They stagnate. They do not realize that they are merely at the beginning and not at the end of their ultimate store of practical knowledge. They do not realize that their education is but a guide book to help them discover the pathways leading to the summit of the mountain called Success.

Some of these "self-satisfied saps" acquire a supercilious attitude toward their fellow workmen. These they insult and irritate. They, themselves, are the losers. How much better off they would be if they would only know the advantages to be gained by becoming fraternal with the men who have not had the same benefits educationally. Tolerance is a virtue which some know not.

As an example of the value of the democratic attitude on the part of young chemical engineers, I have in mind an involved case which was solved by that very attitude.

Years ago a new plant was built and after it had been operated for a time, the superintendent wrote up the operating results. They were so unusual that engineers and executives of other companies in the industry

were tremendously intrigued. Dozens of them journeyed to the city where the new plant was situated. They visited the plant, gazed at the equipment and operations and inspected the results, but saw nothing upon which to base any doubt that the startling published results were being obtained in practice.

However, one executive (I shall call him John Doe) who contemplated the construction of a similar plant in his city was not so sure. Before going ahead he wanted to be convinced that the process and equipment were all they were claimed to be. So he arranged with the management of the new plant to permit a group of outside test engineers to make a careful operating check-up and for a young engineer we shall call Smith to act as official observer for Doe's company.

For six weeks the operating check-up was conducted and Smith observed the tests and studied the data. Smith found that in his studies of the data, there were glaring discrepancies between the formerly published and current test results which could not be reconciled. It occurred to him that the cause of these discrepancies might be in certain equipment and test methods formerly employed, but unfortunately it seemed impossible to check these details at this late date.

He had, however, become friendly with an employe currently engaged in hand labor on tar pumps. During lunch period conversations, he discovered that this plant employe had previously been the operator of certain test equipment and had unwittingly conducted the published tests in an inaccurate manner. No one had discovered this fact before and when the author of the paper ascertained that the data for his surprising article had been in gross error, he was, of course a crest-fallen man. However, those who discovered the fact respected his courtesy in permitting the plant operations to be checked by an outside group and therefore did not reveal publicly the error which had been found.

The main point of this story is that truth is often to be obtained where you least expect to find it. Had the young engineer, Smith, not been a tolerant and democratic college man with as real an interest in the men in dirty overalls as in the white collared manager, the real facts about the new plant and its true operating results might not have been disclosed so soon.

Had the young chemical engineer been one of the supercilious saps I have mentioned, another great mistake might have been made—a costly plant might have been built which could never have measured up to the unusual operating results which had previously been published.

Too often also, we find young graduates with excellent educations in their professional fields, but with a

horrible lack of that most useful characteristic known as tact.

I recall a young engineer whom I shall call Brown. He was engaged in chemical engineering and skillful in its techniques. His tact, however, was conspicuous by its absence.

One day he was put in charge of a job requiring the placement of a large gas engine which involved both good carpentry and pipe-fitting. An excellent German carpenter, famed for his ability as a cabinet-maker, and an exceptional Irish pipe-fitter were secured. These men were put under Brown's supervision and the work was started.

The next day at lunch-time, I overheard the carpenter talking to the pipe-fitter about Brown. Evidently, neither man liked Brown. The conversation was about as follows:

Carpenter: "Who is dot nutty fallah?"

Pipe-Fitter: "Begorrah! Don't yuh know who he is? Why! Heez wan of dose great chimists. He gradwaited frum Stibbins Hardward and tuck a pus-grad-wait corse at Sears Roebuck's!"

The derisive character of their conversation impelled me to inquire as to the cause of it. I soon found out that Brown had attempted to show the German carpenter, who took well-warranted pride in his workmanship, just how to manipulate his saw. Brown also had deemed it necessary to instruct the Irish pipe-fitter how to use his Stillson wrench upon the pipe and pipe-fittings.

You may be interested to know that Brown, despite the fact he was tried out in various positions and duties, could never make good. He never learned how to get along with his fellow-workers. His tactlessness in all human relationships was so pronounced, I finally had to discharge him.

Then we find the young graduate chemist or chemical engineer who is excellently versed in matters chemical, but who allows himself to become so steeped in the study and practice of juggling chemical atoms and molecules, that he loses his perspective. He is unable to translate the results of his chemical work into language intelligible to the laymen who must make practical use of such results.

To illustrate, I recall a case of this kind in which a young chemical engineer was given a sample of white lead paste to analyze for the company's purchasing agent. As was the practice, he not only made the chemical analysis, but also prepared a letter reporting his findings. When his proposed report was submitted to the superintendent of the laboratory for approval, here is what the superintendent read:

"Mr. Blank, Purchasing Agent.

Dear Sir:—

Sample of white lead paste No. 4364 from Blankety Blank Co. analyses as follows:"

There followed a tabulation of the

chemical formula of each constituent and the percentage found. The letter then closed with the usual "Yours truly,"—nothing more. When the superintendent asked this graduate chemical engineer if he thought the letter report was of any use to the purchasing agent, the young man was offended and insisted his analytical determinations had been checked to the second decimal place.

He entirely lost sight of the point of the superintendent's question. The superintendent then proceeded to explain to the young man how a letter of that sort was about as useful to an average purchasing agent as the hieroglyphics on a piece of Egyptian papyrus.

If the chemical engineer had mentally pictured himself as the purchasing agent, unfamiliar with chemical terms, he would have expressed and interpreted his results in plain language which would have made them understandable and serviceable.

There are a few chemists like that, who never seem to realize nor do they seek to learn what their work is intended to accomplish.

Then we have the case of a highly educated engineer who is graduated with honors from one of the foremost technical institutions in this country. He also has those finer characteristics and qualifications which are so necessary for success. Yet he is afflicted with envy and handicapped with a tendency to concern himself with odious comparisons of his own progress with that of his associates. He gives vent to what he considers unfair treatment by his superintendent, thus undermining the morale of his associates and causing discontent.

I remember one of these. He was an engineer with both good education and experience. He had every reason to expect success for he was well qualified to achieve it but for one bad fault. His incessant attention to what others were doing caused his own performance to decline measurably in comparison with that of his associates. He blamed failure on nearly everyone else, and most of all, on his superintendent. He expressed his unwarranted attitude by becoming a "snake-in-the-grass" type of employe. He struck at the organization he worked in by surreptitiously spreading tales poisonous to morale and causing discontent. It is a matter of record that when his insidious actions were discovered, he was discharged.

The famous football coach, Amos Alonzo Stagg, knew only too well the value of concentrating full attention on the fair attainment of objectives in athletics or in business. I well remember when he lined up about fifty of us at one end of a football field and told us to sprint to the other end with all the concentrated effort we could put into it.

Afterwards Stagg called the fifty of us around him and said, "Some of you men were altogether too interest-

ed in what the other fellows were doing to ever win a race yourself. I think it is as true in business as it is in athletics, that when you have a special job to do, concentrate on it. Now you men line up again and run the 110 yards without throwing yourselves off stride by looking around to see how the other fellows are doing."

That is pretty good advice for anyone. And so I might go on and on reciting examples of the failure of young chemists and engineers to achieve even a reasonable measure of success, due to some one or two striking deficiencies with respect to human relations.

So much for "pitfalls" and the failures of some chemists and engineers. We may dismiss them with the thought that had they recognized the importance of human relationships and strengthened their weak characteristics in this respect, different stories of success might be told about them.

Let us look at the positive and brighter side of the picture. Consider those young graduates, chemists and engineers, who are engaged by a company that believes in advancing the worthy ones ultimately into important positions. At one time, I was superintendent of a laboratory which had a definite program for carrying out such a policy. My boss would call at the laboratory once in awhile and in his delicious Southern drawl say to me, "Hah-pur, have yah enny throne-shakurs on the roll this mornin'?" Fortunately I could usually reply in the affirmative whenever I had ten or more new men on the payroll, for the ratio of "throne-shakers" usually was of the order of one for every ten men employed.

I can recite to you many illustrations of successes subsequently achieved by these "throne-shakers." I have in mind several who are now the presidents of large corporations. Others have not only reached high positions in the management of various companies, but in some cases have made independent successes as consultants or as operators of their own businesses.

Most of these men realized from the start that pleasant treatment of others costs little, but pays great dividends.

Without making an individual analysis of the factors which probably made success possible in each of these cases, I can say without reservation that all of these men were well-balanced individuals. While naturally varying in degree and kind in their human relationship qualifications, they had or rapidly acquired those essentials for success, developed, and made use of them. They did not rely entirely on their knowledge and technical skill. I feel sure that they realized the importance and relative value of both education and technical skills, and of the general qualifications of

character, judgment, efficiency and understanding.

The Successful Corporation

We have considered the cases of individuals. Let us consider for a moment the case of corporations or groups of individuals. Corporations, after all, are only groups of individuals bound together in a cooperative effort. To succeed, they, like individuals, must give heed to a knowledge of the kind of business in which they engage, and to skills in the techniques of operation. Furthermore, since they depend for their very existence upon good customer and other contacts, satisfactory human relations are essential. I think it safe to say they are much more dependent than the individual, upon general public and customer approval of their services or products. Being what they are—aggregations of individuals—corporations reflect the composite character of such individuals.

Being selective in its choice of personnel, a corporation naturally seeks to employ the best qualified persons it can get to occupy its positions. Consequently, it is axiomatic that its composite character should be above the general average of individuals.

To me a large corporation, such as the one in which I am privileged to work, is primarily a group of carefully selected individuals working together as a team having a strong team or family spirit. Being composed of individuals, it has the characteristics of individuals. To succeed, and it has succeeded in spite of adversities of many kinds during its more than ninety years of existence, it must have the general acceptance and approval of its customers and the public.

Since "ignorance breeds suspicion," some people look upon such a large corporation as a powerful not-to-be-trusted entity delivering a mysterious unseen something through equally mysterious and untrustworthy contrivances. On the other hand, many look upon the organization as a large, efficient concern supplying them with a uniform commodity of carefully checked value, through a metering mechanism maintaining greater accuracy than the average watch.

Despite the accusations, castigating statements and present day mud-slinging partisans and class-hatred inciters of all categories, large and small, corporations and businesses exist and succeed because they generally recognize the fundamental necessity "to play the game fairly" with their customers.

True, there are exceptions, but percentage wise, I sincerely believe that corporations are better balanced and have better average characteristics than the average individual. The larger they are the more this must be true for their success.

Corporations are no more soulless than the individuals composing them. In fact, they glisten with a real hu-

manity not always discernible to the outsider. At least they adopt and develop general policies which often reflect more interest in good human relations than does the average individual. As one who has looked from without as well as from within corporation management, I know whereof I speak.

From without, where all the facts and considerations are not evident, one has too little before him to sit in fair judgment on a corporation and proceed to criticize and condemn it or its management. Yet today, it is popular for the radical, the demagogue, and the inciter of hatreds to throw dust in the mental eyes of the average good American citizen probably to divert his attention from their nefarious objectives.

Now what has all of this to do with chemists and engineers? Or to do with Tom, Dick, and Harry, and with Minnie, Myrtle, and Mary for that matter? What has it all to do with such questions as, "Can I succeed in life? Can I conduct my business successfully? Can I advance in the corporation in which I work? Can I become an outstanding chemist?"

If you will reflect upon these matters, if you will introspectively investigate your own lives and experiences, I believe you will conclude that affirmative answers to these questions are not only possible, but probable, when the human relations involved are well-balanced and of high quality.

Each of us can achieve some measure of success if we do no more than "perform something worthy of being remembered."

We chemists and engineers, we American citizens, can easily find too many examples where the mantles of success have fallen on worthy shoulders to long question the possibility of such achievement for ourselves, our professions or vocations, our businesses and corporations.

We know that it has been done. With a fervent desire to succeed, with a valiant effort to do so, and with a full appreciation at all times of the rights of our fellow men, I feel assured each and all of us will agree that IT CAN BE DONE.

Perkin Medal Award

Elmer K. Bolton, chemical director of E. I. du Pont de Nemours and Company, has been awarded the Perkin medal of the American Section of the Society of Chemical Industry, in recognition of his outstanding accomplishments in the field of industrial research. The presentation of the medal will be made on January fifth at the Commodore Hotel, at a dinner meeting. Norman A. Shepard, F.A.I.C., chairman of the American Section of the society will preside. The medal will be presented by Marston T. Bogert, F.A.I.C.

Edward A. Doisy, F.A.I.C., professor of biochemistry at St. Louis University, has just been awarded the 1943 Nobel prize in medicine jointly with Henrik Dam of Copenhagen (now at Strong Memorial Hospital, Rochester, N. Y.) for their discovery of the chemical nature of the K vitamins.

Dr. Doisy, educated at the University of Illinois and Harvard Medical School, is well-known for his work on sex hormones, blood components, and the antihemorrhagic vitamins. He began work on the fractionation of vitamin K extracts in 1936, and by 1939 had determined and isolated two vitamins, K_1 from alfalfa and K_2 from putrefied sardine meal. The synthesis of K_1 was shortly accomplished, followed later by the synthesis of K_3.

Blum Awarded Medal

William Blum, chief of the section of electrochemistry of the National Bureau of Standards, was awarded the eighth Edward Goodrich Acheson Medal and $1,000, by the Electrochemical Society at its October convention at Buffalo, N. Y. The award was made in recognition of Dr. Blum's contributions to the standardization of electroplating methods and of plating formulas. Speakers were Sidney D. Kirkpatrick, president of the society; Hiram S. Lukens, F.A.I.C., Thomas Slattery and Dr. Blum.

Dr. Blum received the Medal Award of THE AMERICAN INSTITUTE OF CHEMISTS in 1926.

A symposium on "Liquid Fuels" was held by the Association of Consulting Engineers, New York, N. Y. on October 24th. Speakers were Benjamin T. Brooks, Walter M. Fuchs, F.A.I.C., and Henry M. Shields.

Harper And His Achievements

R. M. Conner

Director, American Gas Association Testing Laboratories

AMERICAN Man of Science; Fellow of the American Association for the Advancement of Science and of your own organization, THE AMERICAN INSTITUTE OF CHEMISTS; holder of the Walton Clark Gold Medal of the Franklin Institute of Philadelphia and the Beal Gold Medal of the Gas Industry; and now—the Scroll Award of this organization—these are the distinguished honors that mark the achievements of Robert Brinton Harper!

Distinctions such as these must be well merited. As a friend and close associate of Bob Harper who has known him and worked with him for many years in the gas industry, I can assure you that they are most justly deserved. Moreover, they are absorbed with grace and philosophical objectiveness befitting a man of science and warm personality; friendly, appreciative, and genuinely interested in his fellow man—a unique combination of the scientist, executive, citizen, and man's man that the very human Bob Harper presents. No finer choice of a man to honor could be found in the gas industry. In fact you are to be congratulated on your choice as much as Bob is to be congratulated upon receipt of your award.

The accomplishments of Bob Harper are so many and of such a diversified character that it becomes most difficult to attempt to bring out more than a few highlights of his career. Consequently, in presenting some of the principal contributions he has made to industry, science, and the public, I would have you bear in mind first that they are but highlights of his many achievements and, secondly, that throughout the nearly forty years of his career in the gas industry, Bob maintained a constant interest in his fellow man.

This is revealed in the titles of such published articles as "Chemistry as a Career," "The Value of a Technical Education," and "The Chemical Engineer in the Gas Industry" found sprinkled throughout a vast number of technical papers. Knitting together all the elements of his character and his work gives us at least a partial conception of the strong personality which has permitted him to accomplish many things in many

fields and to endow the whole with an overall awareness of unity, strength, and singleness of purpose.

It was with a keen conception of the value of science and particularly of chemistry that the young man (fresh from Armour Institute of Technology) first entered the employ of The Peoples Gas Light and Coke Company. President Roosevelt (Theodore) had just returned from a two month's vacation in the west. A war was on at that time too you know; in fact the Russian-Japanese conflict was settled in that year of 1905. The Panama Canal commission was also appointed and the Airship "California Arrow" flew forty-five miles at Los Angeles. As you can see, those were historic days also. But confining myself to my subject, the keen awareness of the value of science easily seen in the life of Bob Harper was already firmly established, probably fostered and inspired by a physician father who must have transmitted along with this thirst for science a large share of the well-known philosophical patience and kindliness for which the doctors of that day were known. For this young man was no ordinary chemist.

It was not until some twenty years later that I first met and came to know Bob. He already was a man of considerable accomplishment and stature in the gas industry. He had risen from assistant chemist to chemist in charge, to chief chemist and chemical engineer, to chief testing engineer and to superintendent of the Testing Department, this consisting of chemical, plant, and utilization testing as well as all company photographic activities. At thirty-three he had served as president of the Illinois Gas Association, the youngest man to hold the office.

Scientific thoroughness undoubtedly had carried him far. The kind of thoroughness that in those early days painstakingly sought out and found the answer to the reason for occasional explosions of acetylene storage cylinders from no apparent cause. Accumulation of phosphorus dihydride in cylinders from impurities present in some limestones used in manufacturing calcium carbide was proved responsible. Or again his thorough charting of 289 factors affecting the manufacture of carbureted water gas, the influence of which until that time had been largely a mystery.

This study blazed the trail for supplementary research leading to better control, higher efficiency, and lower cost in water gas production. It was the kind of challenge Bob liked best —the same sort of thing that happened when a works superintendent said to him, "You chemists can't tell us beforehand what sort of results to expect from any given 'gas oil.' All you can do is to distill oils and make other tests identifying them as being similar to or different from other oils which we have already found to be

good, bad, or indifferent by actual plant operation."

Bob came up with the answer to that one too, providing a mathematical determination of values, a "cracking apparatus" and testing procedures which in the fifteen years following their development were used in purchasing more than 800 million gallons of gas oil, saving a substantial portion of 13 million dollars estimated as the spread between oils of various quality available. The test methods and apparatus naturally were wisely adopted by the American gas industry.

Showing his versatility, Bob likewise investigated numerous protective pipe coatings under various conditions of use and developed test procedures later adopted in principle by the National Bureau of Standards. Essentially, use was made of two metal plates for measuring the resistance of coatings under various conditions to the passage of electricity. Bob called his instrument the "Porosimeter," but we will have to forgive him for he was born just thirty-five years too soon to have this device, which is still in wide use today, fall within the scope of socalled "Electronics."

When the gas industry decided to create its own central laboratory following World War I, it was not in the least surprising to find Bob Harper one of the most enthusiastic promoters of the movement. Looking backward, we can now appreciate his foresight far more readily than was possible at the time. Into the establishment of the American Gas Association Testing Laboratories, he put a great deal of intensive effort which brought rich returns.

There materialized an effective organization which provided practical means for the gas industry to exercise a program of self-regulation for the mutual and long-range benefits of its millions of consumers. Adoption and application of a rigid policy of approval and marking of domestic gas equipment using gas fuel for the protection of the gas-consuming public proved a unique chapter in the history of American business. It remains the envy of competing industries, none of which has been able to point to similar accomplishments.

In these endeavors I first came to know Bob—to respect him—and to admire him. He not only took a most active part in establishing the Laboratories but also participated in their management for seventeen years as a member of their Managing Committee. His support in those early days can hardly be overestimated. His high technical standing in the gas industry was of immense assistance in setting up national safety standards applied in the examination and approval of domestic gas equipment. Their preparation was the responsibility of the Approval Requirements Committee of which Bob was a charter member.

Later he served as its Chairman for some fourteen years. During that

time the scope of this committee expanded to the point that it and its subgroups included in their membership over 300 national authorities on gas and gas appliances. Shortly after assuming the Chairmanship, Bob's committee became a Sectional Committee of the American Standards Association. Since that time more than thirty basic standards adopted by it have been endorsed by the American Standards Association.

Thus at our own Laboratories in this one example of hundreds of Association assignments, we have been able to evaluate the man, the scientist, the executive, and the organizer. We have been able through our close contacts to come to know much about his remarkable personality as few have been privileged to do. My wish is to attempt to transmit to you some of the warmth and the encouragement and the philosophy that has its generation in his being. For in that being has been and continues to be the spark of inspiration which has kindled many flames of hope and service and devotion in the hearts of countless young men. In our own industry there is hardly a portion that has not benefited or has not been affected by Bob Harper's works, deeds, and words.

Into his work as an executive and organizer, Bob carried many of the same attributes which stood him so well in purely scientific endeavors. While often the transition from pure science to associated positions in management is difficult to the average engineer, this was not the case for Bob. It seems that his everexpanding personality knew no bounds, for as time marched on he handled an ever-greater growing burden of responsibilities with apparent ease. To a remarkable degree he has the knack of handling men, probably because he is so interested in them and because he knows that in their welfare lies the solution to many a problem.

Bob was presented with the Beal Medal in 1931, a distinction awarded annually for the best technical paper published in the gas industry during the preceding year. This award aptly illustrates his ability to plan, organize, and carry out projects of large scope involving the services and cooperation of hundreds of persons. His winning paper was a description of the method originated by him and used by The Peoples Gas Light and Coke Company for converting Chicago's 10,000,000 gas burners from manufactured gas to mixture of manufactured and natural gas. This marked a new record in handling such conversions. The procedures established have since been widely employed by the gas industry.

In 1938 his managerial abilities again were given prominent recognition when the Franklin Institute of Philadelphia awarded him the Walton Clark Gold Medal. This distinction was given in recognition of his leading part in the development, super-

vision, and direction of a research and testing laboratory of outstanding excellence in the gas industry, his cooperation both personally and through members of his staff with the gas industry generally, and his own distinguished work in the chemistry and physics of our industry. As vice-presidente in charge of research and testing for his company, his laboratories have grown into eight departments manned by a normal complement of about eighty engineers and chemists.

These few brief highlights in the career of Bob Harper do not even begin to do justice in adequately setting forth the vast scope or the tremendous quantity of his work and his accomplishments. Still I think that they do provide a good picture of his talents and abilities as a scientist, executive, and engineer. They also clearly demonstrate that his work has not been confined to his own company's individual interests, broad as they are. Many and perhaps the majority of his activities have been of a special and particular nature which cut across closely specialized lines and redound to the benefit, progress, and enlightenment of not only the entire gas industry but advancement of the best interests of a large share of the American public.

But above and beyond indirect public service through commercial channels is another phase of his life and his personality—one of direct public service to the people—rendered by Bob Harper as the citizen. In these endeavors he has undoubtedly been motivated by the same inner social consciousness and friendly warmth for his fellow man that have persisted to this day in keeping him interested in the welfare of employees of his own company and educational opportunities for men of technical and scientific bent. His success in this field is fully as outstanding as in all others in which he has engaged.

As a citizen, the list of civic, historical, and scientific organizations which he has served not merely as a member but in numerous chairmanships and committees is too long to enumerate. Likewise he has engaged in direct service for government agencies. I have in mind such examples as his participation during World War I in studies and investigations of ways and means of obtaining toluene from manufactured gas to provide a base for high explosives; investigations into the utilization of coals and service on commissions to advise on wartime fuel problems. His public services during the present war have similarly ranged from consultant to the Referee Board of the Chemicals Branch of the Office of Production Research and Development to numerous assignments connected with civilian defense and the conservation of materials.

Back of all these activities and accomplishments, of course, lies the man himself and his human attributes. This has already been ably handled.

Rather than to reiterate what has already been said I merely wish to affirm the personal tribute paid by the previous speaker. In conclusion I want to say again that the distinction which comes to Bob Harper tonight not only is justly deserved but will be absorbed with grace befitting a man of science and genial personality genuinely interested in the welfare of his fellow man. Congratulations, Bob, and congratulations, members of the Chicago Chapter, the AMERICAN INSTITUTE OF CHEMISTS, on your selection of Robert Brinton Harper as the recipient of your distinguished award.

Robert Brinton Harper, The Man

George F. Mitchell

President, Peoples Gas, Light & Coke Company, Chicago, Illinois

THE Harper family tree in this country dates back beyond the Revolutionary War. Mr. Harper's immediate ancestors were early settlers in Western Kentucky, later moving over into Indiana, where Bob was born in the thriving town of Evansville.

To find out about "Harper The Man" it was necessary to get the viewpoint of those who are presently associated with him, as well as those who previously worked under his direction. So I took the direct method of asking several of such individuals to reduce to writing what they would say about Bob if they had been asked to do my job tonight. The results were astounding, and while I shall not embarrass Bob by mentioning all of the good things they said about him, I shall not hold back on the disagreeable things they said; neither shall I identify the individuals who may or may not recognize some of the data or expressions they used when writing about Bob.

One of them said, for instance, that Bob, being born in Indiana, was automatically classified as a "hoosier" and hoosiers were supposed to derive their intellectual attainments from major dieting on corn meal and channel cat. He pointed out that when Bob first came to Chicago, however, he was not celebrated for his mental superiority but might, in the language of the chemist, be considered a totally unfinished nucleus.

However, long and exacting attendance at the University of Chicago and Armour Institute of Technology, now known as Illinois Tech, made a tremendous change. Educational facilities did for him what the gamut of chemical changes does for any nucleus.

During those years he was subjected to constructive additions, such as moderate ethylation and constant hydroxylation. Side chains were added under rigid temperature controls, with the result that our honored guest, Robert Brinton Harper, contains in the proper proportions: Oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, with traces of chlorine, sulphur, potassium, copper, iron, magnesium, iodine, bromine, boron, and manganese.

Seriously, that is about the way technical reports often look to management. Chemical and technical data are like that—taken alone they have limited meaning—they must be properly interpreted if they are to be understandable and useful to the average person.

This points to one of Bob Harper's characteristics. He has the ability to reduce the engineering facts of complex problems to simple terms, which make them valuable tools of management. This puts scientific theory to practical work in the hands, not only of top executives, but also of superintendents, foremen, and the rank and file of industry.

It has been said that "a scientist is a genius in one direction and crazy in all others." If the definition is correct, Harper is not a scientist. He has an insatiable curiosity along all lines and thoroughly broadens his store of knowledge. One favorite expression of his illustrates this: "The more I learn, the more I find I do not know," and in that humility of spirit he approaches all problems.

When asked about his own achievements in chemistry, he said: "Most of my time has been spent getting other people to work." Today, however, members of his staff frankly admit that no one works harder than their chief. He is never happier than when he is attacking a difficult problem in person, and he still cherishes the secret ambition to devote himself primarily to research. He has the happy faculty of being a teacher, as well as a scientist. Too often the two attributes are not associated. Over his entire industrial career he has inducted young men into the service of his Company and the Industry, and he has done a remarkable job. He has built up in them integrity, industry, and the love of a job well done.

When Bob started with the Peoples Company in 1905 the chemist and his production control tests were not welcomed by the men who operated the gas plants. Some of the old timers, not realizing they were in a chemical business, did not think chemistry was practical. Others feared the chemist as a "main office spy," but Bob's patience, good nature, and determination did much to dispel their skepticism and to build good will and cooperation between the gas plant operators and the laboratory personnel.

During the years as chief chemist and later vice president in charge of

research and testing for The Peoples Gas Light and Coke Company of Chicago, Harper has had very broad contacts in all countries with scientific agencies and people. He is respected and honored by all for his vast knowledge and his sturdy honesty. He has the incomparable gift of intense industry and has done as much, if not more, for the gas industry than any other one man.

In 1910 he organized for his Company a "cadet engineering" plan in which young men with technical education were engaged at our Main Laboratory and given preliminary training in the fundamentals of the gas business. After a period of gas plant and laboratory experience the cadet became available for promotion into supervisory positions as openings occurred for which he had demonstrated adequate qualifications.

The value of this system in securing and training technical personnel is indicated in part by the fact that, in addition to his own Research and Testing organization, a substantial percentage of the management personnel in other divisions of the Company received their early training under Mr. Harper's supervision.

Many years ago he realized that the production and utilization of all forms of energy were accompanied by certain inherent hazards. With this idea firmly fixed in mind, together with a few others in the industry, he recognized the necessity for some form of policing the industry from within to see that its customers were provided with modern, safe appliances. This idea, plus the energy of himself and others in the industry, resulted in the establishment by the American Gas Association and the manufacturers of gas appliances of testing laboratories at Cleveland and Los Angeles.

For many years he was most active on the Managing Committee of those laboratories, with the result that no self-respecting gas company or manufacturer of gas appliances will now offer for sale appliances which have not equalled or surpassed the performance and safety standards established by those laboratories.

In the short time at my disposal it is not possible to completely cover "Harper, The Man." In addition to being an intense worker, he played just as hard as he worked.

On behalf of your fellow officers and associates may I publicly thank you, Bob, for your fine spirit of cooperation and helpfulness over the years. We are all happy that you are being so signally honored by the members of your profession. As one of your associates of long standing and as one of the many warm friends who have come to respect "Harper, The Man" as a man, as well as a great chemist, let me add in conclusion that you, Robert Brinton Harper, are worthy of any honor which these associates in the chemical field may see fit to bestow upon you.

The Obligations of a Scientist

Frederick T. Addicott

Santa Barbara College, University of California

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THE criticism has frequently been raised that scientists are as much responsible for the evils of civilization and the horrors of war as they are for the good arising from their contribution to our present technical advancement. The implication of the criticism is that scientists should either limit the breadth of their activities or else guide the application of their work so that their results could not possibly be misused. The object of this note is to make two points: one, there is no valid basis for such criticisms of science; two, a scientist has certain obligations which, if met, discharge his responsibilites to society.

The fallacy of a scientist being able to predetermine all the ultimate uses to which the results of his efforts might be put is self-evident. In addition, it could be argued extensively and successfully that the good arising from the results of scientific effort has far exceeded the evil. But in a larger sense science is responsible for neither.

The principal concern of science is to add to our knowledge. It should not be considered primarily responsible for the use society makes of that knowledge. In the final analysis it is the option of society to approve or reject the utilization of these additions. Many cases are on record in which society has permitted the withholding of technical advancements, even though they were of obvious benefit. Is it not then equally the option and obligation of society to reject such applications of knowledge as would appear to be detrimental to the common good?

The duty of the scientist is to search for truth disinterestedly and to present his findings without prejudice. One of the principal duties of students of social problems should be to examine and recommend the best utilization of the advancements of science.

Such a division of responsibility is inherent with the complexities of our civilization. The achievement of an advance of real worth may require the undivided attention of one or more scientists for an extended period. Fortunately, the results of years of work can often be summarized concisely, even into a single word such as "penicillin." Although many scientists can suggest applications for their findings,

it requires also the full cooperation of those concerned with social problems to achieve the maximum benefit from even such an obviously desirable discovery as penicillin. The final responsibility of the utilization of knowledge rests upon this group and not upon the scientists who discover it.

Does this mean then that the scientist is free to become a recluse and ignore the world about him in the pursuit of his scientific interests? No, a scientist has obligations to his calling and to society which can not be ignored.

First, and most important, is his obligation to the scientific method. Too often does one meet workers in scientific fields whose fine training has been lost through subjugation of scientific principles to personal whimsey. A scientist most constantly reexamine himself and his work and keep both in line with the most rigorous scientific precepts. Only by so doing can he be sure that his efforts will be a real and lasting contribution to society.

Second, a scientist must conscientiously instruct those who come under his tutelage, whether they be students or associates. He must instruct them both in the scientific method and in knowledge which has been established. It is as essential to pass on the scientific method to future generations as it is to practise it. Courses which are alleged to emphasize training in the scientific method should not ignore it completely! (In this connection Richmond's[1] recommendation of a course in "scientific method" for all college students is one that should be considered most seriously). It is important also for a scientist to fulfil his teaching obligations completely. A teacher in science must constantly add to his personal store of knowledge new facts as they are made known. He must sift these carefully and give his students a sound foundation to which they can add the advancements that accrue in their lifetimes.

Third, a scientist has the obligation to indicate clearly to society what good he believes might be achieved from his contribution to knowledge. This is an obligation which should be taken seriously. Although he may not know fully the needs of society, he knows his work, and he should where possible take the first step towards the full utilization of his results.

It is possible that many would wish to modify these suggestions. It might be valuable to amplify and extend them. If, however, this discussion stimulates the reader to consider his relations to society and the obligations which they impose, the writing of this note will have been well justified. If, however, a scientist should acknowledge the three obligations listed here and conscientiously attempt to fulfil them, he is worthy of a respected place in society and his contributions will

1 SCIENCE, 99: 2576, 385, 1944.

be lasting. After the scientist does his part, it is then the duty of those who guide society to see that means are available for the utilization of the achievements of science for the highest good.

Brooklyn Polytechnic Conducts Seminar on High Polymers

A series of seminars on High Polymers is now being given at the Polytechnic Institute of Brooklyn, New York. The series began on October 14th and is being held on alternate Saturdays from 11 o'clock a. m. to 1 o'clock p. m. The final lecture will be given on May 26th.

The Firestone Tire and Rubber Company reports that its new laboratory building, being constructed in Akron, Ohio, is rapidly nearing completion. Chemical and engineering research personnel will be housed in the new laboratory where enlarged facilities and modern equipment will be available for the company's extensive research program in the fields of rubber, plastics, metals, adhesives, and other materials.

Hilton Ira Jones, F.A.I.C., spoke on "Science and the Future," before Stephenson County Teachers' Institute at Freeport, Illinois, on October 18th. Dr. Jones is managing director of Hizone Research Laboratories, Wilmette, Illinois.

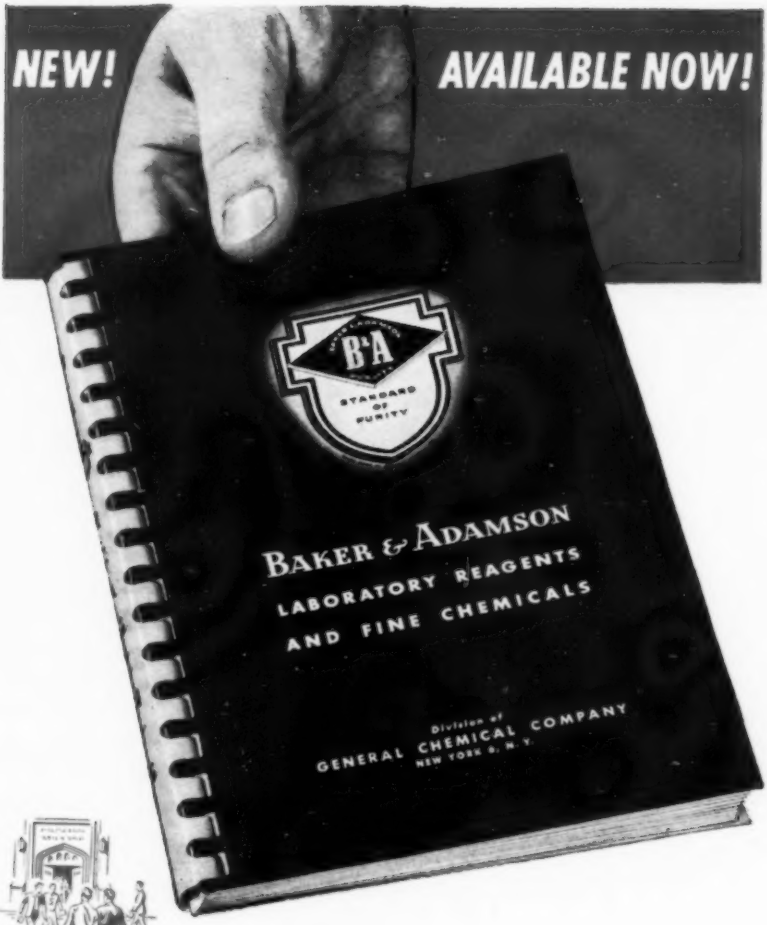
Works Now Director of National Roster

George A. Works, dean of students at the University of Chicago, is succeeding Dr. Leonard Carmichael as director of the National Roster of Scientific and Specialized Personnel. Dr. Carmichael, president of Tufts College, Medford, Mass., will serve the Roster as consultant.

Gustav Egloff, F.A.I.C., will speak on the "Activities of THE AMERICAN INSTITUTE OF CHEMISTS" before the Los Angeles Chapter of the INSTITUTE, on November 27th.

He will discuss "Modern Products from Petroleum," before the San Diego Chapter of the American Chemical Society, on November 29th. The following day, he will address the Southern California Section of the Society of Automotive Engineers, meeting in Hollywood, on "Fuels of the Present and Future." On December first, he will speak on "War and Postwar Products from Petroleum" before the Southern California Section of The American Chemical Society in Los Angeles.

Louis A. Olney, F.A.I.C. has retired as professor emeritus, after forty-seven years' association with the Lowell Textile Institute, where he was head of the department of chemistry and textile coloring.



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Graham, Crowley and Associates Formed.

A. Kenneth Graham and C. A. Crowley, F.A.I.C. have announced the formation of the firm of Graham, Crowley and Associates, Inc., with offices and laboratories at 407 South Dearborn Street, Chicago, and at 473 York Road, Jenkintown, Pennsylvania.

This new organization of consulting electrochemists and engineers is a consolidation of Technical Service Bureau of Chicago and A. Kenneth Graham and Associates of Jenkintown.

Dr. Crowley and Dr. Graham have been consultants to the electrochemical industries for the past ten years, and have increased their technical staff to handle the work of the new firm.

Bradley Dewey Receives Medal

Col. Bradley Dewey received the Chemical Industry Medal of The American Section of the Society of Chemical Industry at its joint meeting with the New York Section of the American Chemical Society and the American Institute of Chemical Engineers, held on November tenth. Dr. Norman A. Shepard, F.A.I.C., presided. Col. Dewey, president of Dewey and Almy Chemical Company, and former Rubber Director, was awarded the medal especially in recognition of his work in colloid chemistry as applied to rubber latex, and for his administration of the synthetic rubber program during the critical war period.

Speakers included, Charles Almy, Dr. Vannevar Bush, Dr. Karl T. Compton, and Dr. Foster D. Snell, F.A.I.C.

Herstein Laboratories Expand

Karl M. Herstein, F.A.I.C., announces the removal of Herstein Laboratories, Inc. to 23 West 47th Street, New York, N. Y. to provide larger quarters for an increased staff. Mr. Herstein, president of the company, has been a consultant for the past twenty-seven years, specializing in process development, industrial research, and the preparation of rare reagents.

Maxwell H. Burry, F.A.I.C., formerly consultant at the Long Island Analytical Laboratory, Mineola, L. I., New York, is now associated with the Mears' Chiropractic Clinic, at St. Albans, Vermont.

Dr. Thomas H. Vaughn, M.A.I.C., assistant director of research, Wyandotte Chemical Corp., Wyandotte, Michigan, addressed the Virginia Blue Ridge Section of the American Chemical Society on October 21, 1944. His lecture, illustrated with slides and motion pictures, on "Some Aspects of Detergents" was thoroughly enjoyed by about seventy-five members and guests of the section.

Toch – The Versatile Scientist

Gustav Egloff, F.A.I.C.
President, THE AMERICAN INSTITUTE OF CHEMISTS

The following five papers were presented at the dinner given by the New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS on October twenty-seventh in honor of Maximilian Toch.

UNTIL I was given the rare privilege of bestowing honorary membership in the INSTITUTE upon Dr. Toch, I had not fully appreciated the extraordinary number of facets which there are to his nature.

Primarily Dr. Toch is a distinguished chemist and a world authority in the field of paints, pigments, oils, varnishes, and surface finishes of all types. He holds degrees in chemistry, chemical engineering, and law from various universities, in addition to special degrees in post-graduate scientific work.

His immediate business affiliations are president and chief chemist of Toch Brothers, Inc., and chairman and chief chemist of the Standard Varnish Works of New York. Outside of his business, which he has never neglected, he has been professor of industrial chemistry at Cooper Union, lecturer on organic chemistry at Columbia University, lecturer at the College of the City of New York, honorary professor at the University of Peking, and professor of the chemistry of artistic painting at the National Academy of Design.

He has been active in original research for over fifty continuous years. He made the first scientific investigation of China wood oil in 1896, and he has published many articles on the subject. This brought him the distinction of being the first American chemist who was invited to honorary professorship at the University of Peking, where he taught the chemistry and testing of China wood and other oils. Dr. Toch was the first to investigate the use of fish oils as drying oils, and was an early contributor to the knowledge of soya bean oil, pine oil, perilla oil, and many other materials. He is a member of the London Paint and Varnish Society and the Industrial Chemical Society of China.

He was one of the earlier investigators of the phenomenon of corrosion,

and reported that the corrosion of iron and steel is an electro-chemical reaction which is of great importance in the development of anti-corrosion methods.

His varied interests have led him to researches in many fields. He developed a plaster containing barium sulfate for use on walls of x-ray rooms in hospitals to prevent unwanted penetration of the rays. He made many innovations in paints for waterproofing and for the difficult problem of surfacing metals, concrete, and stone. During World War I he developed a sealing compound for gas masks, and had charge of camouflage for the United States government. He originated his own system and supervised directly the camouflaging of all our Atlantic coast defense installations.

He has put his profound knowledge of photomicrography and bacteriology to good use in determining the microorganisms which affect baking and tobacco processing. In this connection he is a member of the Society of Bakery Engineers. He has the unique distinction of being known not only as a scientific and technical, but also as an artistic photographer. He has the high honor of being a Fellow of the Royal Photographic Society of Great Britain, a Fellow of the Photographic Society of America, and Fellow of the New York Microscopical Society.

His books include, "The Chemistry and Technology of Paints," "Protection and Decoration of Concrete," "How to Paint Permanent Pictures," and "Paints, Painting and Restoration." John Kieran, sage of "Information Please," reviewing one of Dr. Toch's books, noted his emphasis that art must be simple, and that artists should simplify their work. Kieran concluded, "It would accomplish wonders in this country if somebody were elected to public office on that platform."

He is a member of all of the chemical and chemical engineering societies of America, and the Chemical Society and Society of Chemical Industry of London. In addition, he is honorary member of the Chemical Engineering Society of South Africa, honorary member of the Industrial Chemical Society of China, and Fellow of the Institute of Chemistry of London.

He is a Fellow of the American Association for Advancement of Science, a member of the American Bar Association, The Chemists' Club and the Camera Club of New York; and the Cosmos Club of Washington, D. C. He has twice been recipient of the Camera Club medal. New York University has just formed an alumni association for graduates in chemistry and chemical engineering and Dr. Toch has been elected honorary president.

Dr. Toch has helped many young men to success. They remember him for his firmness tempered by gentleness, sympathy, and helpfulness.

As an illustration of his command of a number of arts, Dr. Toch some years ago challenged the genuineness of the thirty-odd Rembrandts in the Metropolitan Museum of Art and showed that only a few were genuine. He tests the authenticity of paintings by a study of the brushwork used, which is as individual as handwriting; by x-ray and infra-red ray photographs, chemical analysis of the paints and materials used, and by other scientific tests. Thus by the application of his combined knowledge and experience, he is able to detect imitations and has saved many gullible buyers of supposedly genuine paintings by the old masters.

Dr. Toch is also a microbiologist, photographer, an expert on invisible inks and a magician, as well as an outstanding chemist and engineer. He has repeatedly shown up the fakes and fakers in the field of paintings. With rifle or pistol he is a dead shot. All this draws me to the conclusion that he is qualified to be the World's greatest detective, notwithstanding Sherlock Holmes and Dr. Watson, and Hercule Poirot.

He has so many interests that even his good wife says she does not know where he gets the time to do all the things he does. He is an active member of the Society of American Magicians, and many times has new tricks of legerdemain to present before the meetings of the society. When he has nothing else to do he makes photomicrographs of such things as the hind legs of spiders and other anatomical parts of various insects, the weave of cheesecloth, and works of art.

It is my great privilege and honor as president of THE AMERICAN INSTITUTE OF CHEMISTS to confer on Dr. Maxmilian Toch the scroll of honorary membership therein.

Toch and The Chemists' Club

C. R. Downs, F.A.I.C.

President, The Chemists' Club, New York

THE Chemists' Club, including its great chemical library, is a great asset to both the chemical industry and the profession of chemistry. Consequently the activities of Dr. Maximilian Toch in the long history of the Chemists' Club have been a valuable contribution to the advance of our science to its present outstanding position in the world.

Of the one-hundred and fifty-four charter members of the Club, seven

still retain their membership and Dr. Toch is one of them. This is a record in itself.

The Club was founded in 1898, and rented space from the Mendelsohn Glee Club at 108 West 55th Street. Dr. Charles F. Chandler, who was its president for the first three years of its existence, loaned the Club about $2,000 to furnish the rooms. By 1901 the Club was nearly broke and had not paid Chandler interest on the loan. Many of the members had not paid their dues. Something had to be done, and Toch was given a free hand to run its finances.

Here Toch exhibited his business sagacity and his knowledge of human nature. The Club had at that time a colored man by the name of William who was the "autocrat of the corridor." He knew every member and called each "Doctor": The saying was that most of the "doctors" degrees were from William's College.

Letters had been written repeatedly to delinquent members but the dues did not come in. So Toch gave William the addresses of the fifty-odd delinquents, gave him his carfare and told him that he would give him $1 for collecting the dues from each member in arrears. William collected about three-quarters of the outstanding debts. This money permitted the wheels to roll again.

Max Toch and Dr. Morris Loeb, another charter member, were boys together and fast friends. Loeb was also the head of the Department of Chemistry at New York University and Toch lectured there. Loeb proposed to Toch that they sub-rent the hall on 55th Street to various technical societies. So Toch following this lead got the American Chemical Society and the Society of Chemical Industry to rent it at $15.00 per night which brought in $30 per month.

He also put an advertisement in the New York daily papers stating that a meeting room with heat and light was available at $50 per night and the Theosophical Society headed by Annie Besant was one of the first to accept. Fortunately they wanted the hall only on Sunday nights and this brought in an income of $200 to $250 per month. Two or three other organizations also rented the hall and during the first year, a profit of about $2550 could be chalked up to the credit of Toch's good business sense.

Toch was the eighth president of the Chemists' Club in 1907, and, by the way, our beloved Dr. Bogert succeeded him in that office. Seven other prominent chemists had preceded him in office and all worked day and night to make the club a success. By 1908 it is reported that the Club had a surplus of about $10,000, a very creditable performance for such a young organization. This encouraged the Trustees to believe that the Club should acquire its own property and Dr. Charles F. McKenna, one of its earlier presidents, was made chairman

of the committee on plan and scope.

Early in 1909, Toch and Loeb left to attend the Seventh International Congress of Applied Chemistry in London. On the steamer the two men discussed this subject of a Club building. It would take a great deal of money to do it right, and how could this be raised?

McKenna's committee was at work studying possible sites and selected the present location as most suitable. This was offered for sale at $175,000 and Loeb wrote the Trustees from Paris on May 8, 1909, that he would buy it himself and hold it for the Chemists' Building Company to acquire when funds were collected for erection of the building. Needless to say there were many members who were naturally rather timid toward entering on such a large program.

Loeb, who became president in 1909 told Toch that he would put up $50,000 toward the erection of the building, if the latter would collect a like amount, and Dr. Toch has related to me what transpired. Such records of the early years of a struggling body of men should be preserved for later generations. Toch first went to see Dr. William H. Nichols and he subscribed $25,000 of the Building Company stock. Dr. J. B. F. Herreschoff in the next office took $15,000. With $40,000 of his assignment in hand, he telephoned brother Henry asking what to do next, and Henry Toch said, "I will take $6,000 if you will match it." So in one day this young man, who is still young in vision and spirit, had $52,000!

Then Loeb and Toch went to some other friends and in two months had collected a total of about $212,000. The group then engaged six architects, paying each $500 to propose plans for an eleven story building, and York and Sawyer's plan was approved. But $212,000 was far short of the $171,000 paid for the site plus the $400,000 to build the building, let alone furnishing it. So Felix Warburg, Loeb's brother-in-law took a building loan mortgage until a permanent mortgage could be obtained from the Seamen's Bank for Savings.

The building was built and furnished by contributions from many, under the drive of the officers and supporters of the Club, and was ready to be christened at the time of the Eighth International Congress of Applied Chemistry held in New York in September 1912. It is a matter of interest that Dr. Carl Duisburg of the chemical concern, which later became the I. G., attended this Congress and during the meetings at the Club, stated that it was doomed to failure because they had tried such an organization in Berlin. This had been a failure because chemists could not agree on any subject!

It is a matter of great regret that Morris Loeb did not live to witness the ultimate fruition of his efforts, but he left Max Toch, his boyhood friend,

and many others to carry on. This Max has done, having served the Club more years as Trustee and in various other offices than any other member of the Club since its inception forty-six years ago.

May he live long and continue his service to the profession of chemistry.

Toch and the American Institute of Chemists

Howard S. Neiman

Secretary, THE AMERICAN INSTITUTE OF CHEMISTS

IN view of the fact that I have served under every president of the INSTITUTE, I am qualified to refer to Dr. Toch as the most unusual president of the INSTITUTE.

The presidents before him were the usual type of president. They sacrificed their own interests to the INSTITUTE. They endeavored to clear the path of the INSTITUTE's progress of the obstacles which were continually being placed there by those who were so shortsighted that they could see the present only, and who were so stubborn that they would not purchase bifocals in order to see the future. They worked untiringly for the INSTITUTE's welfare. But they did not concern themselves with such things as the condition of the INSTITUTE's treasury.

Then one day it came to our knowledge that we were not too well off financially, but we didn't know what to do about that because we were all chemists, and what does a chemist know about money? Why should a chemist worry about anything, the chemical composition of which was already known? We decided we would have to find a president with a financial sense, a young man, so we selected Maximilian Toch.

The first thing he did, even before he commenced to make his acceptance speech, was to ask me "Where is the balance sheet?" That was one of the most embarrassing moments of my experience. I knew a balance sheet had something to do with money but I did not know what money had to do with a balance sheet. When I asked the treasurer for a balance sheet, he looked worried and perplexed. He finally gave me a sheet, but it didn't seem to me to be balanced. He explained to me that by putting some funny items on one side of it he had brought that side of the sheet to balance with the other side.

I gave the sheet to Dr. Toch and his usual youthful pink turned red.

Dr. Toch was angry. He said, "This balance sheet shows a deficit," and he immediately called a special meeting of the Council. There he told us that he could not afford to be president of an organization which had a balance sheet like ours. Then the Doctor in his calm, gentle, non-dictatorial but persuasive way suggested that the councilors come across with enough to balance the account and they did.

Then Dr. Toch commenced to take rabbits out of the financial hat. He took the money we had out of our bank and put it with what he had collected from the councilors and other members and deposited it all in another bank. He then borrowed money that we didn't need from the bank to build up a credit. Then he borrowed on our credit when we did need it, and when we paid that back we had more credit, so he borrowed money on that credit when we didn't need it. After that, the bank was asking us if it couldn't lend us some money! Now we are in a position where we do not have to borrow money. No other chemist ever knew as much about money as Dr. Toch does!

Dr. Toch has been our standby and steadfast friend and supporter. We look to him for his wisdom and advice. He has the most constructive character I have ever known. It makes no difference to him whether other people agree with him or not, but I have never heard him make a suggestion at the Council where he did not have strong conclusive reasons for everything he said. Dr. Toch's influence upon the INSTITUTE can not be measured by words, and can be understood and appreciated by only those who have had the pleasure of personal contact with him during all these years of faithful service.

THE INSTITUTE owes much more than it can ever repay to this kindly, quiet, unobtrusive man, whose greatest happiness in these later years is in distributing to those around him the valuable fruits plucked from the vines of his life's experiences.

In honoring Dr. Toch tonight, I wish to assure you that the INSTITUTE is conferring a still greater honor upon itself.

Petty with Heyden Chemical Corporation

Gerald M. Petty, F.A.I.C. formerly assistant chemist with Fidelity & Casualty Company of New York, is now supervisor of the Analytical Laboratory of Heyden Chemical Corporation, Penns Neck, New Jersey.

The Association of Consulting Chemists and Chemical Engineers, New York, N. Y. has elected the following officers for 1944-1945: President, Albert Parsons Sachs, F.A.I.C.; Vice president, Henry M. Shields; Secretary, Claude F. Davis; Treasurer, Sam Tour.

To My Friend, Maximilian Toch

Marston T. Bogert, F.A.I.C.

Professor Emeritus, Columbia University

NOTHING could give me greater pleasure than to have my dear friend, Maximilian Toch, honored. It is just fifty years since Max and I met.

His father lived in Bohemia not far from Pilsen. He came over here to this country when the revolutionists of 1848 were being persecuted there, and landed in New York, where he became a dealer and importer of paints and pigments, and where Max was born. At the early age of fourteen, Max completed the first year of work at the College of the City of New York.

Then his father took him to see Professor Chandler at Columbia, but Professor Chandler thought Max was a little too young at fourteen to enter Columbia. So Max and his father went to the Washington Square College of New York University, where Professor Draper agreed to admit him. He was energetic and ambitious and in addition to chemistry, studied law during the later afternoons and in the evenings. At the age of eighteen, he received the B. S. and LL. B. degrees the same day. Later, he passed his law examinations, and was admitted to the bar.

After a vacation in Germany, he returned to New York, where he and his brother Henry took over their father's business and also began the manufacture of paints, etc., on their own account, and the firm of Toch Brothers was born. The greatest good fortune that ever happened to him was when he met Miss Hermine Levy, and she became Mrs. Maximilian Toch. They have four daughters, and if you have ever called upon him, you know what a delightful home he has, filled with love and affectionate companionship. You cease to wonder after you have been there, why Max is such an optimist.

It is difficult to find anything in which he is not interested, microbiology, law, art, photography, teaching, chemistry, microscopy, to mention but a few things.

Max spends much time up in Maine, some of it at Belgrade Lakes, where he has honored me with his visits. He likes to fish with an ordinary sewing thread, number 24, and believes in barbless hooks and Nylon

leaders, but he does not drink, and so he does not, as do most fishermen, take along a jug of "squirrel" whiskey.

Max is entirely unselfish. He asks, "Is the thing worth doing?" not "What can I get out of it?" In his capacity for making friendships, he has no superior.

He is, I think, a good representative of what is meant by "Eternal youth." Youth is a state of mind, measured not by years, but by the quality of the imagination. People grow old when they worry. Youth lasts as long as there is continued desire and appetite for adventure.

Max has always taken advantage of opportunity, because like Walter Malone, he does not believe that "opportunity knocks but once":

"They do me wrong who say I come no more
When once I knock and fail to find you in;
For every day I stand outside your door
And bid you wake and rise to fight and win."

Maximilian Toch

R. J. Moore, F.A.I.C.

President, American Institute of Chemists, 1938-1940

IN 1938 Dr. Toch retired as president of the A. I. C. But no one ever thinks of Dr. Toch as retiring! And he has never retired from giving his help and counsel to the INSTITUTE. He has been its "spark plug" for many years.

He is one of our youngest members in his enthusiasm, his energy and the vigor of his judgment. Moreover, his judgment is never prejudiced hy his emotions. He argues his points with his best friends, but then he must argue with his friends—he has no enemies!

George Baekeland regrets that he cannot be present to honor Dr. Toch tonight, but he is out of the country. However, if he were here, he would speak of the great friendship that existed between Dr. Toch and his father, Dr. Leo H. Baekeland. It was Dr. Toch who first insisted on a hearing for Dr. Baekeland on Velox before America's photographers.

Dr. Toch is a scientist, an artist and a successful manufacturer. These qualities he brought to the A. I. C. He is the Toch that made us tick! In addition, he brought science to art and became the expert in detecting spurious "Old Masters."

He brings new spirit and vivacity to whatever he undertakes. He is not

alone a catalyst which merely increases the speed of a reaction; he takes part in the reaction as well, and indeed frequently supplies the heat and the pressure!

And so tonight, the New York Chapter of the INSTITUTE presents him with this engraved token of their respect, their admiration and—their love.

Dr. Toch's Acknowledgment

Dr. Toch, in accepting the Honorary member of THE AMERICAN INSTITUTE OF CHEMISTS, stated that it was very difficult for him to express his gratitude to the President and the members of the council for the great honor that had been bestowed upon him, but he felt intuitively that everyone knew how deeply he appreciated the distinction, particularly as industrial chemists are seldom awarded this honor.

He mentioned that on another occasion a very great honor had been bestowed upon him and he thought that those present would be interested in hearing one of the highlights of that occasion in preference to the delivery of a stereotyped address. He referred to the occasion when he visited China as Honorary Professor of Industrial Chemistry. The President of China, instead of granting him a private interview as was the custom, decided that he would make it a public function and invite the Ministers and Ambassadors of all the foreign countries.

This reception took place in the great Hall of the Palace and it was a very colorful affair. After greeting him ceremoniously, the President turned to the audience and made a lengthy speech, after which he introduced the "honorable, venerable Professor Doctor" as the first missionary that had ever been invited to China, and he suggested to the Ambassadors that if they had any scientific men who were well versed in industry, China would be glad to welcome them.

Dr. Toch spoke at some length of the pomp and ceremony of this occasion and of his subsequent visit to the "Forbidden City" where he was allowed to see the Chinese paintings of all of the Emperors, dating back a thousand years.

In concluding, he addressed President Egloff again and stressed the point that however great the honor was that he had obtained in China, the one that he had received at the

hands of THE AMERICAN INSTITUTE OF CHEMISTS made a more profound impression upon him and he again thanked all those present for the distinction he had received.

Referring to the statement that had been made with reference to his age, he remarked that "age has no relation to years" and that a man who is in good health and of sound mind can keep on working far beyond the alloted years. It is easy enough, he said, for an old man to sit on a park bench and watch the procession go by when he is no good to himself and a nuisance to everybody else, but as far as he was concerned, Dr. Toch preferred "to wear out rather than rust out."

Gustav Egloff, president, AMERICAN INSTITUTE OF CHEMISTS, was elected Honorary Member of The Chemical, Metallurgical and Mining Society of South Africa, Inc., for the year ending June 30, 1945.

Heyden Chemical Corporation announces that trimethylolpropane, a polyhydric alcohol, is now available. A crystalline, waxy solid, it is used in making low viscosity drying and non-drying alkyd resins.

Robert J. Moore, F.A.I.C., spoke on "Synthetic Resin Plastics" before a meeting of the Engineers' Club of Lehigh University, Bethlehem, Pennsylvania, on November second.

New Plastic Perfected

Monsanto Chemical Company has perfected a new synthetic resin, which when used in a low-pressure lamination process, makes it possible to produce large-size plastic objects inexpensively. Present use of the plastic is restricted to military purposes.

South American Publications on Chemistry

THE Division of Intellectual Cooperation, Pan American Union, Washington, D. C., has suggested that the following list of publications in South America may be of interest to INSTITUTE members. These journals are either completely devoted to chemistry or include articles on chemistry.

Anales de la Academia Nacional de Ciencias Exactas, Fisicas y Naturales de Buenos Aires. Claro C. Dassen, editor. Peru 684, Buenos Aires. Organ of Academy of Exact, Physical, and Natural Sciences of Buenos Aires. Connected with *Anales de la Sociedad Cientifica Argentina.* Scientific articles in Spanish or French on mathematics, physics, chemistry, engineering, and related subjects.

Anales de la Asociacion Quimica Argentina. Five issues a year. Arnoldo Ruspini, editor. Victoria 679, Buenos Aires. 6 pesos a year. Technical articles on organic and inorganic chemistry, microchemistry, analytical, physical, industrial, agricultural, and pharmaceutical chemistry.

Anales de la Sociedad Cientifica Argentina. Monthly. Emilio Rebuelto, editor. Santa Fe 1145, Buenos Aires. Publication of the Sociedad Cientifica Argentina. Articles with bibliographies on chemistry, physics, geology, radiography, natural and related sciences.

Archivos de Farmacia y Bioquimica. Luis C. Verna, editor. Facultad de Farmacia y Bioquimica, Universidad Nacional de Tucuman, Tucuman, Argentina. Scientific articles, with bibliographies, on parasitology, bacteriology, chemistry, pharmacology, and related sciences. Contributions in several languages.

Boletin de la Facultad de Ciencias Exactas, Fisicas y Naturales. Irregular issue. Facultad de Ciencias Exactas, Fisicas y Naturales, Universidad Nacional de Cordoba, Cordoba, Argentina. Organ of the Faculty of Exact, Physical and Natural Sciences. Contributions by faculty and scholars. Technical and scientific section.

Industria y Quimica. Bimonthly. Carlos A. Abeledo, editor. Victoria 679, Buenos Aires. 5 pesos a year subscription. Organ of the Chemical Association of Argentina. Technical articles on industrial chemistry by national and foreign specialists in the field. Related subjects. Bibliographies.

Physis. Revista de la Sociedad Argentina de Ciencias Naturales. 1-5 issues a year. Carlos D. Storni and Jose Milfino, editors. Peru 684, Buenos Aires. Scientific articles in Spanish, English, and German, with bibliographies, on biology, botany, geology, chemistry, and related sciences.

Publicaciones de la Facultad de Ciencias Matematicas, Fisico-Quimicas y Naturales Aplicadas a la Industria de la Universidad National del Litoral, Rosario, Argentina. *Serie Tecnico-cientifica.* 2-4 issues a year. 7 pesos a copy. Research monographs with bibliographies by professors of the faculty.

Publicaciones del Instituto de Investigaciones Microquimicas. Ardoina Martini, editor. Universidad Nacional del Litoral, Rosario, Argentina. Publication devoted to study of microchemistry, microanalysis, microcrystallography, and related branches, by professors and members of the Institute.

Revista de la Asociacion Bioquimica Argentina. Bimonthly. Lucas Desimone, editor. Cevallos 706, Buenos Aires. 10 pesos a year to members. Official organ of the Asociacion Bioquimica Argentina. Research articles, with bibliographies, on chemistry and related branches.

Revista de la Facultad de Ciencias Quimicas. Irregular. Carlos A. Sagastume, editor. Calle 1, esq. 47, La Plata, Argentina. Organ of the Facultad de Quimica y Farmacia, Universidad Nacional de la Plata. Research articles on theoretical, applied and industrial aspects of chemistry and pharmacy. Bibliographies.

Revista del Centro Estudiantes de Farmacia y Bioquimica. Monthly. Juan A. Sozzi, editor. Cordoba 2077, Buenos Aires, Argentina. Organ of the Facultad de Ciencias Medicas, Universidad de Buenos Aires. Original studies and monographs on pharmacy and chemistry, and their related branches. Translations.

Revista Brasileira de Quimica. Monthly. Antonio Furia, editor. Rua 3 de Dezembro 48, Sao Paulo. $3. (U. S. currency) a year. Technical material on economics, national defense, industrial chemistry, and physics.

Revista de Quimica Industrial. Monthly. Jayme Sta. Rosa, editor, rua Senador Dantas 20, Rio de Janeiro, Brazil. 50 cruzeiros a year. Information articles on industrial plants, descriptions of the manufacture of specific products, and chemical studies.

Ciencia. Monthly. Manuel J. Brillo, hijo, editor. Apartado 92, San Jose, Costa Rica. $2. (U. S. currency) a year. Official organ of the Sociedad Cientifica de Costa Rica. Articles on medical sciences, chemistry, pharmacy, and related subjects.

Revista de la Asociacion de la Escuela de Quimica y Farmacia. Eduardo Goetschel, editor. Asociacion de la Escuela de Quimica y Farmacia, Apartado 166, Quito, Ecuador. Organ of the Association of Students of Chemistry and Pharmacy of the Universidad Central. Brief articles on chemistry and pharmacy.

Ciencia, Revista Hispano-Americana de Ciencias Puras y Aplicadas. Monthly. Ignacio Bolivar Urrutia, editor. Altamirano 127, Mexico, D. F. $3. (U. S. currency) a year. Published with the aid of the Mexican Committee for the Promotion of Scientific Research. Contributors from all Latin American countries and the United States. Divided into sections which include "Modern Science," "Original Communications," "Applied Science," and "Summaries of Papers by Scientists."

Anales de la Asociacion de Quimica y Farmacia del Uruguay. Irregular, about 3 times a year. Otto Gonzales Correa, Hector Orlando Ceretta, Roberto W. Rivero, and Alberto A. Aiello, editors. Avenida Agraciado 1464, Montevideo, Uruguay. Organ of the Association of Chemists and Pharmacists of Uruguay. Research papers with bibliographies, on chemistry and pharmacy.

P. H. Revista Estudiantil Cientifica. Bimonthly. Hugo Trimble McColl, editor. Asociacion de Estudiantes de Quimica, Casilla de Correos 198, Montevideo, Uruguay. Official organ of the Association of Chemistry Students of the University of Uruguay. Contributions by professors, students, and professional chemists.

Revista Oficial. Instituto de Quimica Industrial. Monthly. Alberto Ayala, editor. Bernabe Caravia 3797, Montevideo, Uruguay. Organ of the Ministerio de Industria y Trabajo. Articles on agriculture, plant and animal diseases, foods.

Boletin de la Academia de Ciencias Fisicas, Matematicas y Naturales. Quarterly. Alfredo Jahn, F. J. Duarte, and Eduardo Rohl, editors. Apartado 1421, Caracas, Venezuela. Papers by members of the Academy on mathematics, geography, physics, chemistry, geology, natural sciences, and related subjects.

Boletin del Instituto Sudamericano del Petroleo. German E. Villar, editor. Instituto Sudamericano del Petroleo, Avenida Agraciada 1464, Montevideo, Uruguay. Articles on South American petroleum industry. Descriptions of industrial plants and research laboratories. Notes and statistics on petroleum production.

Revista do Instituto Adolfo Lutz. J. P. de Carvalho Lima, editor. Laboratorio Central de Saude Publica, Departmento de Saude do Estado de Sao Paulo, Sao Paulo, Brasil. Articles and research studies on serology, epidemiology, biochemistry, organic chemistry, and other subjects. Bibliographies and summaries in other languages.

On Defining the Chemist

T. C. Daniels

Chairman, California Section, The American Chemical Society.

Reprinted through courtesy of THE VORTEX.

REFERENCE was made on this page last month to an article by M. L. Crossley on "Defining the Chemist." THE CHEMIST 21, 271 (1944). "What is a Chemist?"

Crossley points out that two definitions of the chemist have already been adopted by the National Council, the first in 1936, and the last in April of this year. In 1936, the Council adopted the following definition: "A chemist is one properly versed in the science that treats of the composition of substances and the transformations which they undergo." The specifications for being properly versed in chemistry were:

1. The completion of the requirements for a degree of chemical engineering in an educational institution accredited by the AMERICAN CHEMICAL SOCIETY and either two years experience or two years graduate study in chemistry or chemical engineering or

2. The completion of the requirements for a degree in chemistry or chemical engineering in a nonaccredited educational institution and three years of chemical or chemical engineering work or three years of graduate study in chemistry or chemical engineering, or

3. Recognized accomplishment in one or more branches of chemistry or chemical engineering.

In April of this year a new definition adopted by the Council incorporates the idea of an internship, similar in principle to an internship in medicine. It provides for four different ways for qualifying as a chemist (see News Edition, p. 613, April 25, 1944).

Many chemists are sure to agree with Crossley that the two definitions published by the Council were accepted "without adequate consideration by all." He recommends the adoption of the following definition: "The chemist is a person qualified to ascertain the facts of chemistry and to interpret them with usefulness and distinction."

As a basis for discussion he also proposes the following methods for one to qualify as a chemist:

1. Educational requirements: Certification by a college of high standing that the person has completed satis-

factorily the requirements for a bachelor's degree, the courses leading to which shall have included not less than forty per cent of studies in the humanities and sixty per cent of chemistry and related sciences. In addition, one year of post-graduate study, not less than seventy-five per cent of which is chemistry or chemical engineering. This educational requirement may be waived where accomplishment in the profession proves a person to have its equivalent. The acceptance of evidence that one has met the educational requirements for the profession admits him to the rank of junior chemist.

2. Experience: A minimum of two years of continued experience in chemistry or chemical engineering may qualify a junior chemist for consideration of his acceptance as a chemist. This request may also be met by two years of graduate study in chemistry or chemical engineering. The experience must inoculate the young chemist with the virus of practicability without immunizing him against original thinking.

3. The junior chemist, having met the minimum experience requirement, must provide affidavits from five responsible chemists, in a position to know his work, that in their judgment he qualifies for the profession.

4. Having demonstrated that he has met the above requirements, the chemist shall receive a certificate of his admission to the profession as a chemist.

"Professional solidarity can be achieved only by a definite concept of the obligations the profession imposes on its members."

Crossley's scholarly analysis of the problem is recommended for your consideration.

Necrology

Emerson B. Helm

Emerson B. Helm, director of research of the Industrial Rayon Corporation, Cleveland, Ohio, died recently. He was born in Cleveland, September 29, 1893, and was educated at the University of Florida and Johns Hopkins, obtaining the Ph.D. degree from the latter university.

From 1918 to 1924 he served as chemist for the Gebauer Chemical Corporation; from 1924 to 1927, as manufacturing chemist for the Emerson B. Helm Chemical Company; and from 1927 to the time of his death as director of research for the Industrial Rayon Corporation.

He became a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS in 1937.

Alexis Carrel

Dr. Alexis Carrel, biologist and surgeon, died in Paris, November fifth, of a heart ailment, at the age of seventy-one.

His contributions to surgical techniques and his pioneer experimentation on the transplantation of organs, won the Nobel Prize in medicine for him in 1912.

Dr. Carrel carried on experiments at the Rockefeller Institute from 1906 until 1940, when he went to his native France on a mission for the French Ministry of Health. After the fall of France, he was appointed director of the Foundation for the study of Human Relations by the Vichy regime.

After the liberation of France, the de Gaulle Ministry of Public Health accused him of being a collaborationist, which he vigorously denied. Friends insist that his death was caused by the shock of the accusations made against him.

Dr. Carrel was educated at the University of Lyon, and the University of Chicago.

Thomas Midgley

Thomas Midgley, Jr., president of the American Chemical Society, died at his home in Worthington, Ohio, November second, at the age of 55. At the time of his death Mr. Midgley, famous as the inventor of ethyl gasoline, and Freon, was vice president of the Ethyl Gasoline Corporation; vice president of Kinetic Chemicals, Inc.; director of the Ethyl-Dow Corporation, and vice chairman of the National Inventors' Council.

He received many honors for his outstanding contributions to chemistry. Among these awards were the Nichols Medal of the New York Section of The American Chemical Society in 1923; the William H. Perkin Medal of the American Section of the Society of Chemical Industry in 1937; the Priestley Medal of the American Chemical Society in 1941, and the Willard Gibbs Medal of the Chicago Section of the American Chemical Society in 1942.

Mr. Midgley was born in Beaver Falls, Pennsylvania, was educated at Cornell University, and began his early researches on rubber tires, later becoming vice president of General Motors Research Corporation.

Frank H. Hogan

Frank X. Hogan, vice president in charge of sales of The Container Company, Van Wert, Ohio, died September 30th at Monroe, New York. He was a veteran of World War I, and recently had made outstanding contributions to the development of containers for war materials.

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A MEETING of the National Council of The American Institute of Chemists was held on Friday, October 27, 1944, at the Building Trades Employers' Association Club Rooms, 26th floor, 2 Park Avenue, New York, N. Y., at 4 p.m. with president Gustav Egloff presiding.

The following officers and councilors were present: Messrs.: G. Egloff, H. L. Fisher, F. A. Hessel, W. H. Hill, J, M. McIlvain, R. J. Moore, H. S. Neiman, D. Price, M. Siegel, F. D. Snell, A. L. Taylor, M. Toch, and W. D. Turner. Drs. F. E. Breithut, M. L. Crossley, E. L. Luaces and Miss V. F. Kimball were present.

The minutes of the previous meet-

ing were approved.

The treasurer's report was presented and accepted.

The president read a letter from Miss Elsa Orent Keiles in which she recommended ten of her staff for membership in the Institute.

Dr. Toch encouraged the councilors to go out and meet prospective members of the Institute and interest them in the Institute's activities.

Dr. Luaces reported that 100 per cent of the staff of Chemical Developments Corporation are now members of the Institute.

Discussion took place regarding the type of editorial material which should be contained in the paper. The advantages of THE CHEMIST as an advertising medium were brought to the attention of the councilors who were asked to let potential advertisers know of THE CHEMIST'S value to them.

Dr. Egloff reported that apparently it was difficult to interest chemists in their own professional standing.

Dr. Turner reported for the committee on licensing, that the committee had held two meetings and that it was actively at work.

Dr. Egloff called attention to the publication of the American Association of Engineers entitled, "Technologists' Stake in the Wagner Act," and stated that it was a worthwhile document for consideration by every chemist.

Dr. Egloff reported that a new chapter of the Institute was in the process of being formed in Northern Ohio.

The matter of an executive secretary was discussed and Dr. Egloff presented several applications for this position. Dr. Hessel reported that the Institute could carry a full-time managing secretary with an increase of five hundred in membership. The president was requested to appoint a committee to consider this question further, and he then appointed each member of the National Council to this committee so that the combined wisdom of the councilors would insure a wise choice of secretaries.

Dr. Siegel recommended closer cooperation between the chapter and the National organization.

Upon motion made and seconded the following new members were elected:

Fellows

Camelford, J. A.

(1944), 1396 Union Commerce Building, Cleveland, Ohio.

Cartwright, Leonard C.

(1944), *Research Director,* Foster D. Snell, Inc., 305 Washington Street, Brooklyn 1, New York.

Doty, Carl B.

(1944), *Chemical Engineer,* Eversharp, Inc., 1800 W. Roscoe, Chicago 13, Ill.

Fuchs, Walter M.

(1944), *Consulting Chemist,* 420 Central Park West, New York 25, N. Y.

Gaylor, Peter J.

(1944), *Chemical Engineer,* Standard Oil Development Co., Elizabeth, N. J.

Goldsmith, Henry A.

(1944), *Chemist,* Standard Varnish Works, 2600 Richmond Terrace, S. I., N. Y.

Guiteras, Albert F.

(1944), *Research Director,* Foster D. Snell, Inc., 305 Washington Street, Brooklyn 1, N. Y.

Hatch, George Bates

(1944), *Research Chemist,* The Texas Company, Beacon Research Labs., Beacon, N. Y.

Henning, Charles W.

(1944), *Technical Representative,* Carbide & Carbon Chemical Corp., 2305 East 52nd St., Los Angeles 11, California.

Hill, Richard

(1944), *Chemist,* Maywood Chemical Works, 100 W. Hunter Ave., Maywood, N. J.

Hochstadter, Irving

(1944), 1255 Far Rockaway Blvd., Far Rockaway, Long Island.

Ort, John M.

(1944), *Director of Laboratories,* American Pharmaceutical Co., 525 West 43rd Street, New York, 18, N. Y.

Rugar, George F.

(1944), *Manager of Product Development,* Diamond Alkali Company, P. O. Box 430, Painesville, Ohio.

Strobl, Alexander

(1944), Stroblite Company, 35 West 52nd Street, New York, N. Y.

Theis, Edwin L.

(1944), *Professor of Chemical Engineering,* Lehigh University, Bethlehem, Pennsylvania.

Ziffer, Frederick W.

(1944), *Assistant, Director of Laboratories,* American Pharmaceutical Co., Inc., 525 West 43rd Street, New York, N. Y.

Members

Corvin, Irene

(M.1944), *Chemist,* University of Chicago, Metallurgical Laboratory, Chicago 37, Illinois.

Hess, Paul S.

(M.1944), *Organic Research Chemist,* National Lead Company, 105 York St., Brooklyn, N. Y.

Jura, George

(1944), *Research Associate,* University of Chicago, Department of Chemistry, Chicago 37, Illinois.

Morgan, William C.

(M.1944), *Chief,* Incendiary Filling Laboratory, Pine Bluff Arsenal, Arsenal, Arkansas.

Skarbek, Jeannette J.

(M.1944), *Patent Technician,* Patent Department, Universal Oil Products Company, 310 South Michigan Avenue, Chicago 4, Illinois.

There being no further business, adjournment was taken.

CHAPTERS

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Secretary-treasurer, Edward M. Hanzely
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News Reporter to THE CHEMIST, Ralph Lamenzo

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Secretary-treasurer, Major J. B. Ficklen
L. A. C. Health Department
808 N. Spring Street, Los Angeles, Calif.
Council Representative, R. J. Abernethy

A DINNER meeting was held September 28th, at Clark Hotel, Los Angeles, at 6:30 P. M., with R. J. Abernethy presiding. Thirty-five members and guests were present.

Mr. Abernethy gave a brief review of the past year's activities of the Chapter and of the purposes of the INSTITUTE. He then introduced the speaker of the evening, Stanley K. Cochems, executive secretary of the Los Angeles County Medical Association, who took for his subject "The Need of Organization Today." Fif-

teen years ago he started the Association with a desk and chair, while now the assets, including real estate and library, are worth over a million dollars. He was educated in electrical engineering at Wisconsin but went into newspaper work and now runs the Medical Association very successfully.

In his talk and in the vigorous discussion which followed, Mr. Cochems applied his experiences to the problems of the A.I.C. A profession must be licensed. Standards must be high, and be maintained. The *man* makes the profession. The fundamental purpose of the organization is to enhance the profession. There is a code of ethics. Advertising cannot buy the bulletin or the real professional man. Dues in the Medical Association must be high as $17.50 goes to the county and $20.00 to the state.

The Secretary must be a "No" man, not a "Yes" man, and he had best not be a member of the profession he serves. Executive secretaries are a profession by themselves. An organic chemist, for example, is not likely to be a good executive secretary because he is fundamentally a chemist. With the medical men, the emphasis is on the local body, rather than the national, because the local men know each other and local conditions. The reverse is true with the Dental Society and the American Chemical Society where headquarters assume power to the detriment of local groups. A bulletin should be a money maker and should belong to the organization and not to the advertisers.

The nominating committee, Mr. Henderson, chairman, proposed a slate for election of officers as follows:

Dr. Salathe, chairman; Mr. Greenhood, vice-chairman, and Major Ficklen, secretary-treasurer. The secretary was instructed on motion to cast a unanimous ballot in favor of these candidates. The meeting adjourned at 10 P.M.

Miami Valley

Chairman, E. L. Luaces *Vice-chairman,* J. M. Purdy

Secretary-treasurer, John R. Fisher, Jr.

Chemical Developments Corporation

314 W. 1st Street, Dayton 2, Ohio

Council Representative, Harvey G. Kittredge

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Secretary-treasurer, J. David Reid
Southern Regional Research Laboratory
2100 Robert E. Lee Boulevard
New Orleans 19, Louisiana
Council Representative, Harold A. Levey
News Reporter to THE CHEMIST, Helen M. Robinson

THE October meeting was held at Loyola University on October 16, at 8:00 o'clock. Mr. D. F. J. Lynch, chairman, called the meeting to order. A motion was passed that the committee on Public Relations and Legislation give consideration toward the formalities of an act for the recognition of the chemist as a professional worker or practitioner to be so recognized by law including registration, for presentation before the Louisiana State Legislature in its next meeting in May 1946.

The subject for discussion was "The Patent Situation as it Affects the Chemist." Mr. T. H. Hopper acted as moderator. It was pointed out that research done in government laboratories is generally covered by Public Service Patents and this results in an unsatisfactory situation. The object of a patent being to give exclusive rights to the manufacturer, a public patent is an anomaly in that a monopoly to everyone is not possible. Although the theory of a Public Service patent is to reserve the profits and advantages from government research and discoveries to the people, in actual fact it does not work out this way. The effect of a Public Patent in almost all cases is to throw the research or discovery into the discard. The people of the United States, to whom the patent is given, cannot afford individually to finance the additional work necessary to put the discovery into production and no private company will spend the money without some protection to give them a reasonable chance to get back their money.

With the present system one company would shoulder the expense to perfect the product or discovery but all other companies could share in the profits. For this reason, it was stated that industry would much prefer a government system whereby this type of patent was sold to the highest bidder or at least protection conferred in some way on the manufacturer during the necessarily costly period of development.

The second report of the National Patent Planning Commission was considered in some detail. This report

states that the American patent system is sound and should be continued. However, the public interest could be protected by several modifications:

1. All patent agreements should be recorded.
2. A provision is proposed for cancellation of an issued patent when later information shows it should not have been issued.
3. A public register for the declaration of licensing of patents under reasonable terms is proposed.
4. It is proposed that a single court of patent appeals be established and any new evidence brought out in suits shall be referred back to the patent office. This court shall be the sole reviewing body upon the denial of a patent by the patent office. A definitive yardstick as to what is an invention shall be established.
5. It is proposed that the patent term shall not endure more than twenty years after the application is filed.

During the discussion the opinion was expressed that patent cases should be judged by those with at least some knowledge of the science in question. It was pointed out that chemists wished that lawyers would make the law simpler while lawyers no doubt would like chemists to simplify their science.

New York

Chairman, M. L. Hamlin *Vice-chairman,* Charles N. Frey
Secretary-treasurer, Lloyd W. Davis
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Council Representative, A. Lloyd Taylor
News Reporter to THE CHEMIST, Arthur DeCastro

The New York Chapter gave a dinner in honor of Maximilian Toch, at No. 2 Park Avenue, New York, N. Y., on October twenty-seventh. Dr. Marston L. Hamlin, chairman of the Chapter, presided. Papers read at this meeting are printed elsewhere in this issue of THE CHEMIST.

Niagara

Chairman, M. R. Bhagwat *Vice-chairman,* Frederick L. Koethen

Secretary-treasurer, Frederick L. Sievenpiper
National Aniline Division
Allied Chemical and Dye Corp.
Buffalo, New York

Council Representative, Arthur W. Burwell
Alternate, Alvin F. Shepard
Reporter to THE CHEMIST, John E. Seubert

Pennsylvania

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Council Representative, John M. McIlvain

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Secretary, Ernest J. Umberger
207 Albany Avenue, Takoma Park, Maryland
News Reporter to THE CHEMIST, S. W. Griffin
Council Representative, T. H. Tremearne

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Secretary-treasurer, Jacqueline S. Front
Mellon Institute of Industrial Research
Pittsburgh 13, Pennsylvania
Council Representative, William H. Hill

For Your Library

ORGANIC CHEMISTRY. Fieser and Fieser. *B. C. Heath and Company.* 1944. 1091 pp. Trade edition $8.00. Student edition $6.00.

This is an excellent text on introductory organic chemistry. It is a big book (an abridged edition is planned) of 1043 pages of subject matter; the size is necessary, however, in order adequately to treat the large number of topics discussed. It is written in a clear and interesting style that should prove attractive both to students and others. It is unusually well indexed.

The classification of the subject matter is along conventional lines. Although the student is given an early introduction to aromatic compounds by way of a number of formulas and brief explanations, the text nevertheless clearly divides the aliphatic compounds from the aromatic.

About one-third of the book is devoted to aromatic compounds. This lengthy treatment of aromatics is, perhaps, not justified on the basis of the present day relative importance of the subject. However, much of the material is of such an instructive nature it should be of considerable value in bettering the understanding of the student on the entire subject of organic chemistry. If the section were to be shortened at all the space obtained could profitably be devoted to the inclusion of a chapter on heterocyclic compounds. These compounds, at present, receive only a scattered treatment.

An outstanding feature of Fieser and Fieser's book is the insertion, at various points, of special chapters on such subjects as petroleum, rubber, microbiological processes, synthetic fibers, elastics and resins, accessory dietary factors and advances in chemotherapy. The authors suggest these chapters for optional reading. In the opinion of the reviewer these valuable chapters should be "required" reading.

An up-to-date presentation of material is stressed throughout the book. Modern theories are consistently emphasized. New industrial applications are pointed out. For example, in the chapter on synthetic resins a short discussion is given of organosilicon polymers.

The text is attractively bound and well printed. It appears to be relatively free of errors. It should be well received by both students and teachers; likewise it should appeal to the interested reader seeking to be brought up-to-date in the subject.

—C. A. MACKENZIE, F.A.I.C.

PHYSIKO-CHEMISCHER MESSUNGEN. (Manual of Physical - Chemical Measurements) Edited by C. Drucker. Fifth Revised Edition. *Dover Publications*. Published by authority of U. S. Alien Property Custodian. 986 pp. 6″ x 9″. $4.95.

This volume, published in German, was written and compiled by Wilhelm Ostwald, R. Luther, W. Gerlack, and C. Drucker, and is released under license No. A-194 by the Alien Property Custodian. It was originally copyrighted in 1931 by Academische Verlagsgesellschaft M. B. H., Leipzig.

The Table of Contents is translated into English and a German-English glossary of technical terms has been added.

This well-known manual contains methods for physical measurements in all fields of chemistry and includes bibliographic and reference material.

Schaar and Company, 754 West Lexington Street, Chicago 7, Illinois, have just issued their new Catalog No. 44, Part 1, (Selected Laboratory Equipment), containing 320 pages. Copies may be obtained on request from the company, by mentioning THE CHEMIST.

Acheson Colloids Corporation has issued *Technical Bulletin* No. 1601 which contains a partial bibliography on Graphite.

MOTOR FUEL FROM MOLASSES. William L. Owen. *Sugar*, 90 pp. 6″ x 9″. $5.00.

This is a collection of eleven brief but interesting articles discussing mainly the economic aspects of producing motor fuel, having the same octane rating as the better grades of gasoline, from ethyl alcohol and butyl alcohol. Examples are given of those countries with large supplies of raw materials and relatively small resources in petroleum. An attempt is made to show that the utilization of surplus molassses and grains would be considerable if a program of motor fuel production from these crops be carried out. It is also stressed that molasses and the starches of grains can furnish a satisfactory raw material for rubber. The book contains several tables and graphs and 66 references.

—H. TAUBER, F.A.I.C.

Dri-Steam Products, Inc., 29 Broadway, New York 6, N. Y. have just issued a new catalog, which lists their separators, strainers, and desuperheaters.

The New York Journal of Commerce has issued "Transition Opportunities," a postwar study with special consideration on sales opportunities in foreign and domestic markets. Copies are 25 cents each from the Journal at 63 Park Row, New York 15, N. Y.

Two articles on the control of scale and corrosion in engine jacket cooling systems are contained in the September issue of *H-O-H Lighthouse,* house organ of D. W. Haering and Company, Inc. The first article, on "Diesel Engine Cooling Water Treatment," gives the results of tests by one of the major railroads. The second, on "Scale and Corrosion Control in Engine Jacket Cooling Systems" is of interest to operators of water cooled equiment. A copy of the *Lighthouse* may be obtained from the company at 205 W. Wacker Drive, Chicago 6, Illinois, by mentioning THE CHEMIST.

Two technical booklets, one on "The Properties and uses of Ethyl Cellulose," and the other on "Ethyl Cellulose Formulations with Resins and Plasticizers," have been published by Hercules Powder Company's Cellulose Products Department, Wilmington, Delaware.

Research Today, publication of the Lilly Research Laboratories of Eli Lilly and Company, in its Fall issue features an article on "Malaria."

Bakelite Review for October features "Designed for Living—the influence of plastics on postwar furniture manufacture and design."

Interchemical Review, published by the Research Laboratories of Interchemical Corporation, New York, features articles on "Particle Size Analysis," and "Spectrophotometry in Evaluating Colorants," in its Autumn issue.

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ELECTRO-CHEMIST. For concentrated independent research and application of electrolytic techniques to non-aqueous solvents. Doctorate degree preferred. Man over 30 desired. Permanent position. Salary open.

CHEMICAL ENGINEER (Pilot Plant). For engineering in heavy chemical industrial field involving pilot plant design, layout, etc. Minimum requirement, B.S. degree and industrial experience in design and operation of pilot plant equipment. Permanent position. Salary open.

For the above positions, all of which are in the St. Louis area, please reply to Box 111, THE CHEMIST.

Roy C. Newton, F.A.I.C., vice president, Swift and Company, Chicago, discussed "New Research Developments in Industry" at a joint luncheon, held on November fifteenth, Lasalle Hotel, Chicago, attended by the Chicago Association of Commerce and the local section of the American Chemical Society.

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Meeting Dates

Nov. 27. Meeting Los Angeles Chapter. THE AMERICAN INSTITUTE OF CHEMISTS, Los Angeles, California. Speaker: Dr. Gustav Egloff, president, A.I.C. "The Activities of the Institute."

Nov. 28. Meeting. Pennsylvania Chapter. THE AMERICAN INSTITUTE OF CHEMISTS. Engineers' Club, Philadelphia.

Dec. 1. New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS 26th Floor. No. 2 Park Avenue, New York, N. Y. Speakers: Col. L. T. Sutherland, C.W.S., "The Synthetic Plastics Industry—Random Observations," Dr. C. L. Mantell, Consulting Chemical Engineer, "The Non-ferrous Metals During the War and in the Postwar Period."

Dec. 8. Dinner Meeting, Chicago Chapter, THE AMERICAN INSTITUTE OF CHEMISTS. Huyler's Restaurant, 310 South Michigan Avenue, Chicago. 6 p. m. Speakers: Dr. Otto Eisenschiml, president, Scientific Oil Compounding Company; E. Gordon Fox, vice president; Freyn Engineering Company; Dr. A. J. Carlson, professor emeritus, University of Chicago, and president, American Association for the Advancement of Science. Subject: "What Shall We Do With Germany?"

Dec. 14. Dinner and Business Meeting. Baltimore Chapter. THE AMERICAN INSTITUTE OF CHEMISTS, Northway Apartments, Baltimore, 6:30 p. m.

Jan. 12, 1945. Technical Meeting, American Association of Textile Chemists and Colorists, New York Section.

Jan. 26. New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS 26th Floor. No. 2 Park Avenue, New York, N. Y. Speakers: C. L. Gabriel, Vice President, Publicker Commercial Alcohol Company, "Recent Developments in Fermentation Chemistry"; Dr. Evan C. Williams, Director of Research, General Aniline and Film Corporation, "The Chemist in Management."

Jan. 30. Meeting. Pennsylvania Chapter. THE AMERICAN INSTITUTE OF CHEMISTS. Engineers' Club, Philadelphia.

Feb. 15. Meeting Baltimore Chapter. THE AMERICAN INSTITUTE OF CHEMISTS.

Feb. 26. Meeting. Washington, D. C. Chapter. THE AMERICAN INSTITUTE OF CHEMISTS. Speaker: Dr. Gustav Egloff, president, A.I.C.

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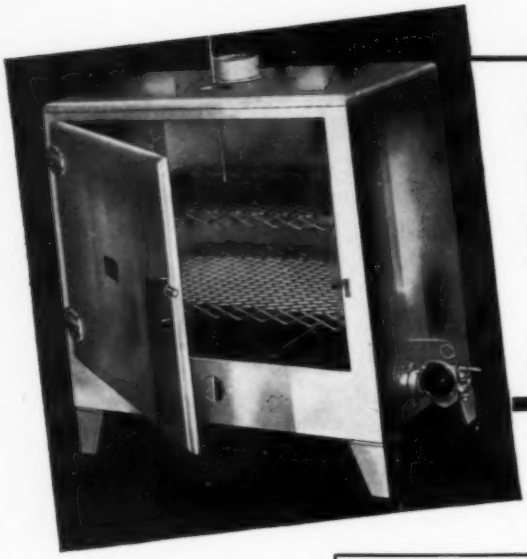

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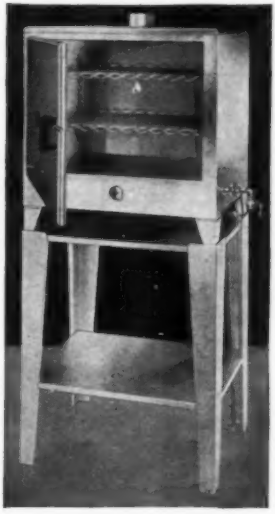

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